CEEP Center for Evaluation & Education Policy

National and International Assessments: How Do Indiana Students Compare?

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Headlines About International Assessments

EDUCATION WEEK

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U.S. Achievement Stalls as Other Nations Make Gains

A student walks near posters advertising an after-school tutorial academy, after attending a tutoring session Wednesday in Hong Kong. Attending an after school tutorial academy is standard practice for many students in the former British colony. Hong Kong's students ranked second in science and reading in the recently released PISA test data, and third in math.
—Kin Cheung/AP

Headlines About U.S. Assessments

Not good enough: Math, reading scores up slightly

Report on US 4th-, 8th-graders released

Associated Press

WASHINGTON — Sometimes the best isn't good enough: Most American fourth- and eighth-graders still lack basic skills in math and reading despite record high scores on a national exam.

Yes, today's students are doing better than those who came before them. But the improvements have come at a snail's pace.

The 2013 Nation's Report Card released Thursday finds that the vast majority of the students still are not demonstrating solid academic performance in either math or reading. Stubborn gaps persist between the performances of white children and their Hispanic and black counterparts, who scored much lower.

Overall, just 42 percent of fourth-graders and 35 percent of eighth-graders scored at or above the proficient level in math. In reading, 35 percent of fourth-graders and 34 percent of eighth-graders hit that mark.

Still, as state and federal policies evolve in the post-No Child Left Behind era, the nation's schoolchildren are doing better today on the test than they did in the early 1990s, when such tracking started, with more improvement in math than in reading. Students of all races have shown improvement over the years.

The results come from the National Assessment of Educational Progress, or NAEP, which is given every two years to a sample of fourth- and eighth-graders.

This year's results, compared with results in 2011, show average incremental gains of about one or two points on a 500-point scale in math and reading in both grades, although the one-point gain in fourth-grade reading was not considered statistically significant.

Read the report

http://nationsreportcard.gov/reading_math_2013.

Five Sources of Information

- ISTEP
- Program for International Student Assessment (PISA – 15 year olds)
- Trends in International Mathematics and Science Study (TIMSS – grades 4 and 12)
- Progress in International Reading Literacy Study (PIRLS – grade 4)
- National Assessment of Educational Progress (NAEP – grades 4 and 8, some data for grade 12)
- PISA, TIMSS, PIRLS, and NAEP are all designed to provide information on students' strengths and weaknesses – they are not designed to rank countries or states.

ISTEP in the Headlines

ISTEP score results indicate wealth plays a role

By Scott Elliott, scott.elliott@indystar.com 7:37 a.m. EDT September 19, 2013

(Photo: Danese Kenon/The Star)

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Carmel and Zionsville, the two wealthiest communities in Indiana, ranked No. 1 and 2 in the percentage of students who passed the ISTEP test this past spring. The scores were released Wednesday.

How big a role did money play in their success?

It's a question that troubles not only critics of Indiana's testing and funding systems but also school leaders in wealthy communities.

What This Year's ISTEP+ Gains Say About Indiana Students – Now, And Long-Term

SEPTEMBER 23, 2013 | 8:26 AM

BY ELLE MOXLEY

More student passed the statewide ISTEP+ exam this spring than last, continuing the gains Indiana students have been making on the test for the past five years.

"Two and a half percent is a pretty big jump for a single year, so we find that very encouraging," says Derek Redelman, the vice president for education and workforce development policy at the Indiana Chamber of Commerce.

STATEIMPACT PHOTO ILLUSTRATION BY KYLE STOKES

The statewide pass rate on ISTEP+ went up 2.5 percent in 2013, in spite of computer glitches that halted testing for two days in the spring.

Statewide, **73.5 percent** of Indiana students passed both the math and English language arts ISTEP+ tests this spring — that's a 10 percent increase in pass rates since 2008.

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StateImpact Indiana is a collaboration of **WFIU** and Indiana Public Broadcasting stations to explain the effects of state education policy on people's lives.

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FEATURED POSTS

What State Board Members Said After Glenda Ritz Walked Out Of Wednesday's Meeting

What Glenda Ritz, State Board Fight Says About Education Governance In Indiana

Why Kentucky Might Provide A Template For What To Do With The Common Core

ISTEP

- Statewide, 73.5 % of Indiana students passed both the English language arts and math portion of the ISTEP+ test
- From 2012, this is a 2.5% increase in ISTEP pass rates.
- Since 2008, ISTEP pass rates have increased by 10%.

PISA in the Headlines

Education Week's blogs > Rick Hess Straight Up

Rick Hess STRAIGHT UP

« The Press Dropped the Ball on the Common Core | Main | Randi for Chancellor? »

7 Reasons I Don't Care About the PISA Results

By Rick Hess on December 4, 2013 7:36 AM

82 Tweet

Yesterday, the triennial PISA results were announced, prompting a paroxysm of spastic pontificating. Hands were wrung, familiar talking points were rehashed, and PISA Overlord Andreas Schleicher once again took the results as his cue to lecture American educators and policymakers on the wonders of common standards and the perniciousness of school choice. (Not that Schleicher has ever seemed an especially strategic operator; I'm curious whether the cheerleading of this international bureaucrat will really help the cause of the Common Core.) Anyway, the funny thing is that all this gnashing of teeth is, quite literally, for nothing. There are at least seven reasons I don't give a fig about the PISA results. What are they?

PISA

- Goal of PISA is to assess students' preparation for challenges of life as young adults
- Assessment measures math, science, and reading literacy of 15-year-old students around the world
- In 2012, 65 education systems – including the 34 members of the Organization for Economic Cooperation and Development (OECD) participated
- Three U.S. states participated in PISA 2012: Connecticut, Florida, and Massachusetts

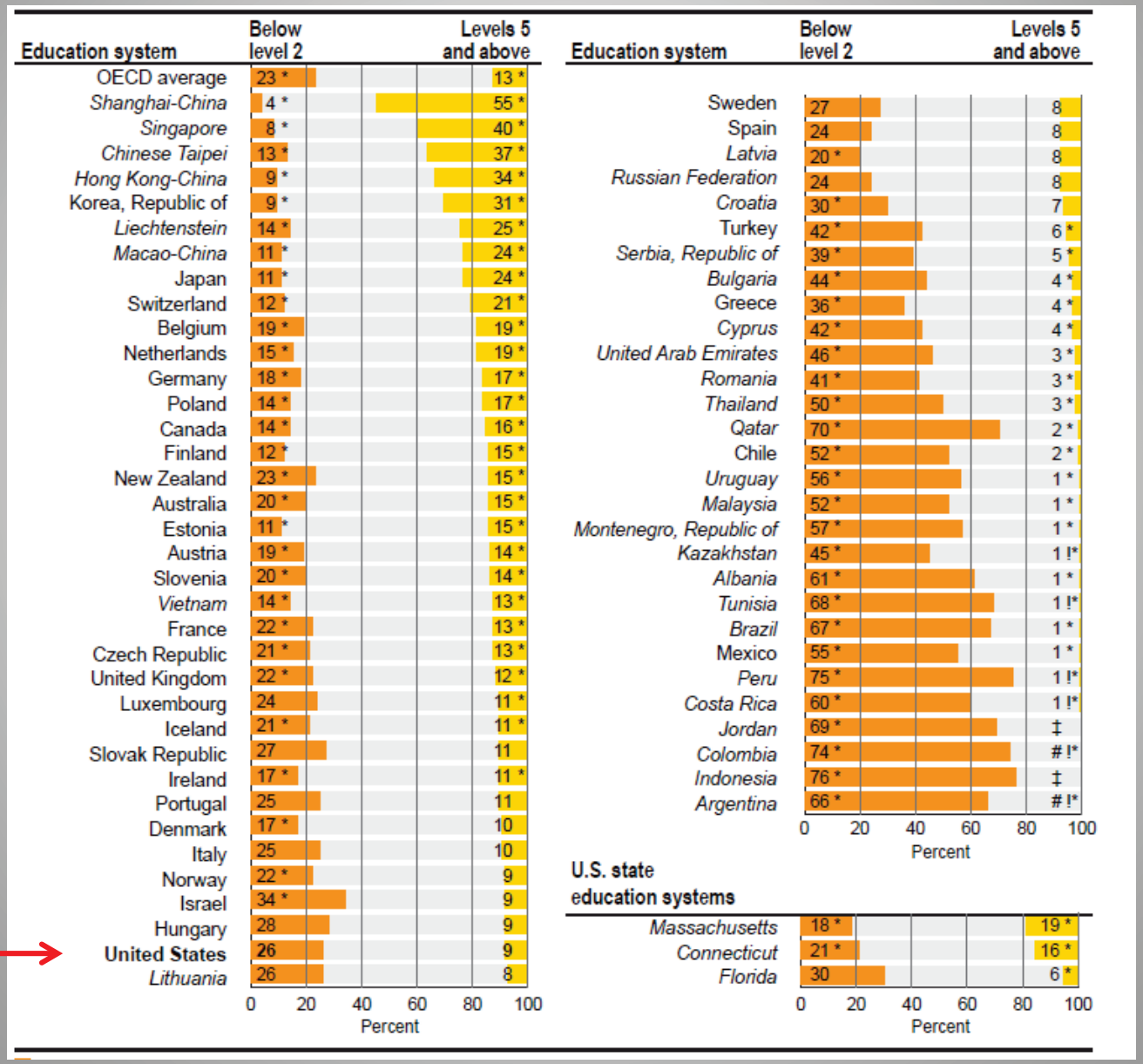
PISA Results

- Overall, there has been *no significant change* in the performance of U.S. students over time.
- U.S. performed below OECD average on mathematics measures, though science and reading performance were not measurably different from OECD average.
  - Because PISA uses a relatively small number of items, PISA scores and rankings are less accurate than scores and rankings on most other assessments.
- Among the three participating U.S. states, Massachusetts performed above the OECD average on all three subjects, Connecticut performed above average in reading and science.

PISA Results: Math

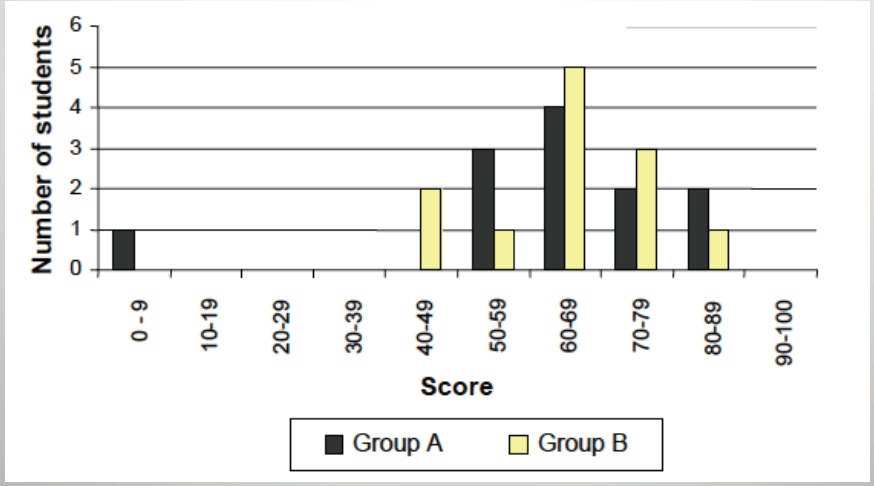
- The U.S. performed below average in mathematics, ranked 26th among 34 OECD countries (on par with Latvia, Hungary, Spain).
  - Percentage of U.S. students reaching the highest levels of proficiency lower than OECD average:
    - 8.8% reached Level 5 (12.6% OECD average)
    - 2% reached Level 6 (3% OECD average)
  - 26% of U.S. 15-year-olds do not reach PISA baseline level 2 of mathematics proficiency, which is higher than the OECD average of 23%.
  - Average scores in mathematics literacy ranged from 613 in Shanghai – China to 368 in Peru. The U.S. average score was 481, which is lower than OECD average of 494.

MATH: Percentage of 15-year-old students performing at PISA proficiency Levels 5 and above, below Level 2 in 2012



PISA "Test Scores" Item

- The diagram below shows the results on a Science test for two groups, labeled as Group A and Group B. The mean score for Group A is 62.0 and the mean for Group B is 64.5. Students pass this test when their score is 50 or above.
- Looking at the diagram, the teacher claims that Group B did better than Group A in this test. The students in Group A don't agree with their teacher. They try to convince the teacher that Group B may not necessarily have done better.
- Give one mathematical argument, using the graph, that the students in Group A could use.



PISA "Litter" Item

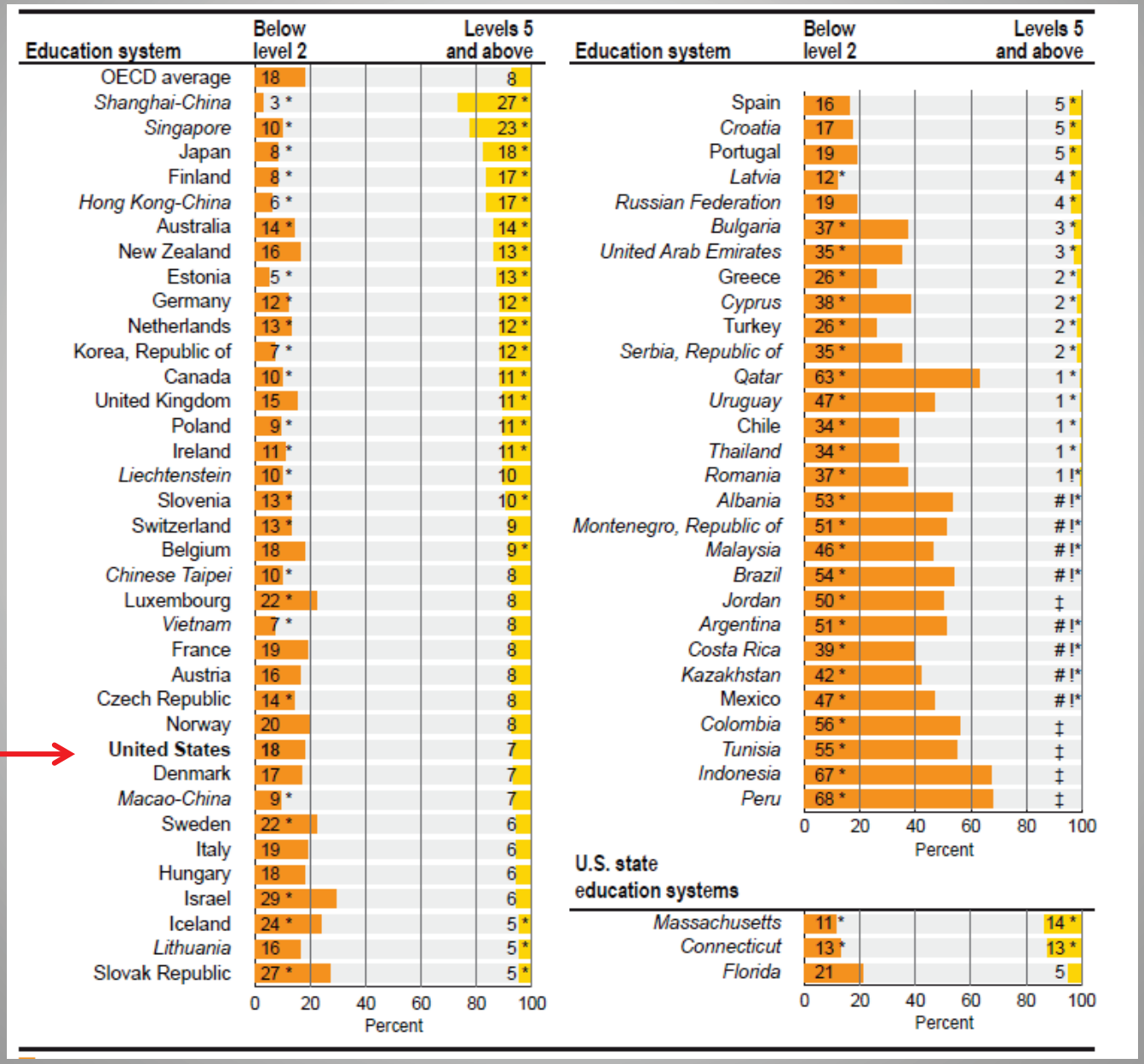
- For a homework assignment, students collected information on the decomposition time of several types of litter that people throw away. A student thinks of displaying the results in a bar graph.
- Give one reason why a bar graph is unsuitable for displaying these data.

Type of Litter	Decomposition Time
Banana peel	1–3 years
Orange peel	1–3 years
Cardboard boxes	0.5 year
Chewing gum	20-25 years
Newspapers	A few days
Polystyrene cups	Over 100 years

PISA Results: Science

- US performed close to OECD average
  - At 7%, the percentage of U.S. students at Level 5 & Level 6 proficiency was similar to OECD average
  - Approximately 18% of U.S. students were below Level 2 in science proficiency, similar to OECD average
  - Average scores in science literacy ranged from 580 in Shanghai – China to 373 in Peru. The U.S. average score was 497, which was not measurably different from the OECD average of 501.

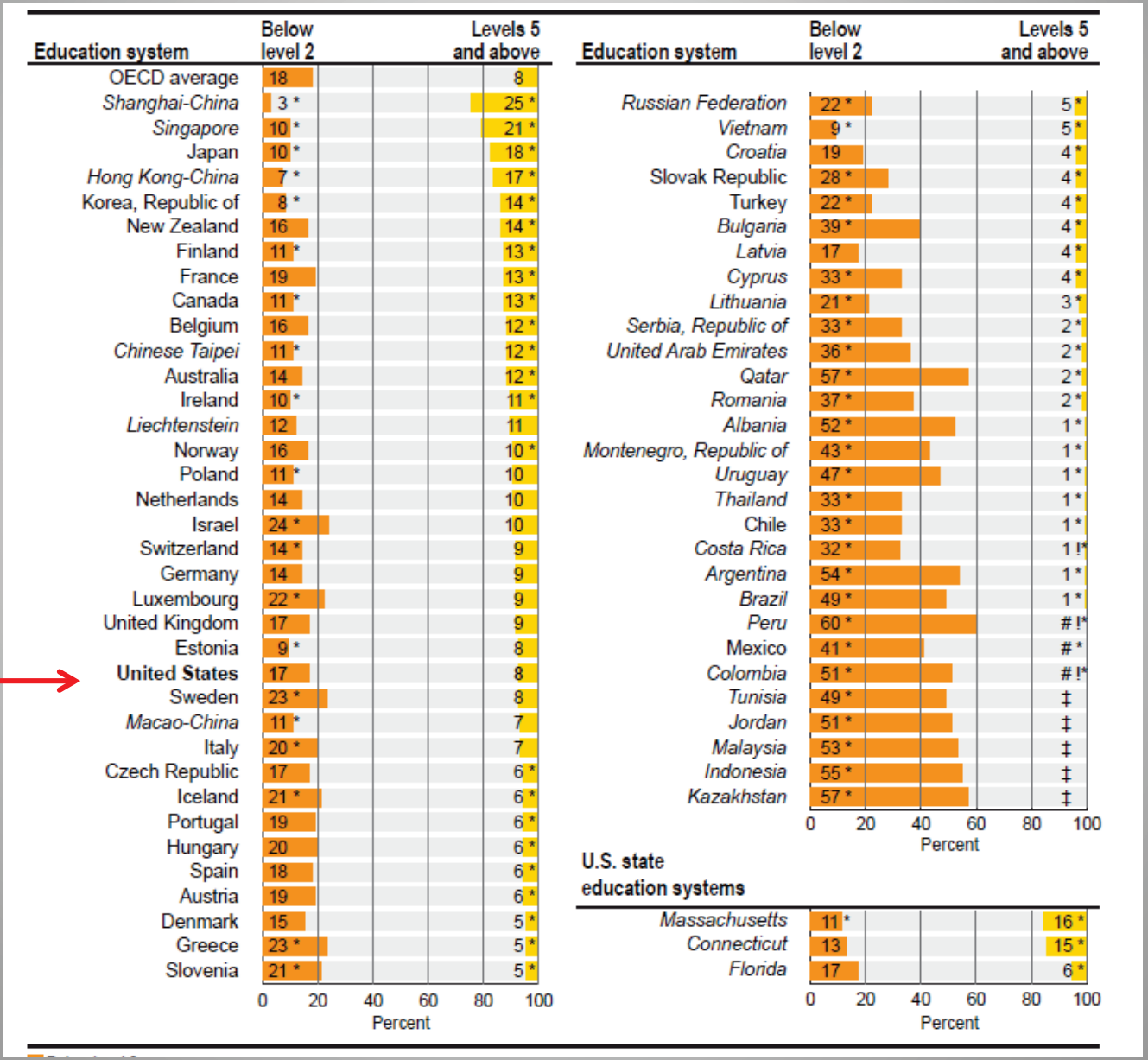
SCIENCE: Percentage of 15-year-old students performing at PISA proficiency Levels 5 and above, below Level 2 in 2012



PISA Results: Reading

- U.S. performed close to OECD average
  - At 8%, the percentage of U.S. students who performed at Level 5 & Level 6 proficiency levels was similar to OECD average.
  - Percentage of U.S. students performing below Level 2 in reading proficiency was 16.6%, compared to OECD average of 18.0%.
  - Average reading scores ranged from 570 in Shanghai to 384 in Peru. The U.S. average score was 498, not measurably different from OECD average of 496.

READING: Percentage of 15-year-old students performing at PISA proficiency Levels 5 and above, below Level 2 in 2012



PISA: Considering Shanghai's Data

- Shanghai was top performer in all three categories (math, science, reading)
- Shanghai's population of migrant children is not represented in PISA scores, as the public schools do not admit migrant children
- Though the PISA assessment is conducted in multiple Chinese provinces, China only releases data from Shanghai and Hong Kong

PISA: Characteristics of US students

- Share of students from disadvantaged backgrounds in the U.S. is average compared to other nations. The proportion of U.S. students below the poverty level is much higher than other OECD countries.

- Students' socio-economic backgrounds impacted performance: 15% of variation explained by SES

- Among OECD countries, U.S. has 6th largest population of students with an immigrant background

PISA: Classroom & School Climate in the US

- Over 80% of students in the U.S. strongly agree or agree that their teachers are interested in their well-being (compared to 59% in Japan)
- Approximately 80% of U.S. students attend schools whose principals strongly agreed or agreed that the morale of teachers in their schools is high (compared to 91% OECD average)
- Less than 10% of principals report teacher absenteeism or tardiness as a problem that hinders learning

PISA: Future Possibilities

- An OECD study estimated that if the U.S. boosts its average PISA scores by 25 points over the next 25 years, this would add USD 41 trillion to economy over the lifetime of generation born in 2010

- Narrowing the achievement gap by bringing all students to a baseline level of proficiency for the OECD would increase GDP of U.S. by USD 72 trillion, according to historical growth relationships

TIMSS Background

- TIMSS assesses mathematics and science achievement.
- Purpose of TIMSS is to learn whether students are learning what is taught in school.
- Administered at grades 4 and 8 every four years since 1995.
- In contrast to PISA which is completed by OECD members each time it is administered, PISA has only a small number of countries participating at every administration.
  - Rankings change over time as much based on which countries participate for each administration as they do on performance within a country.

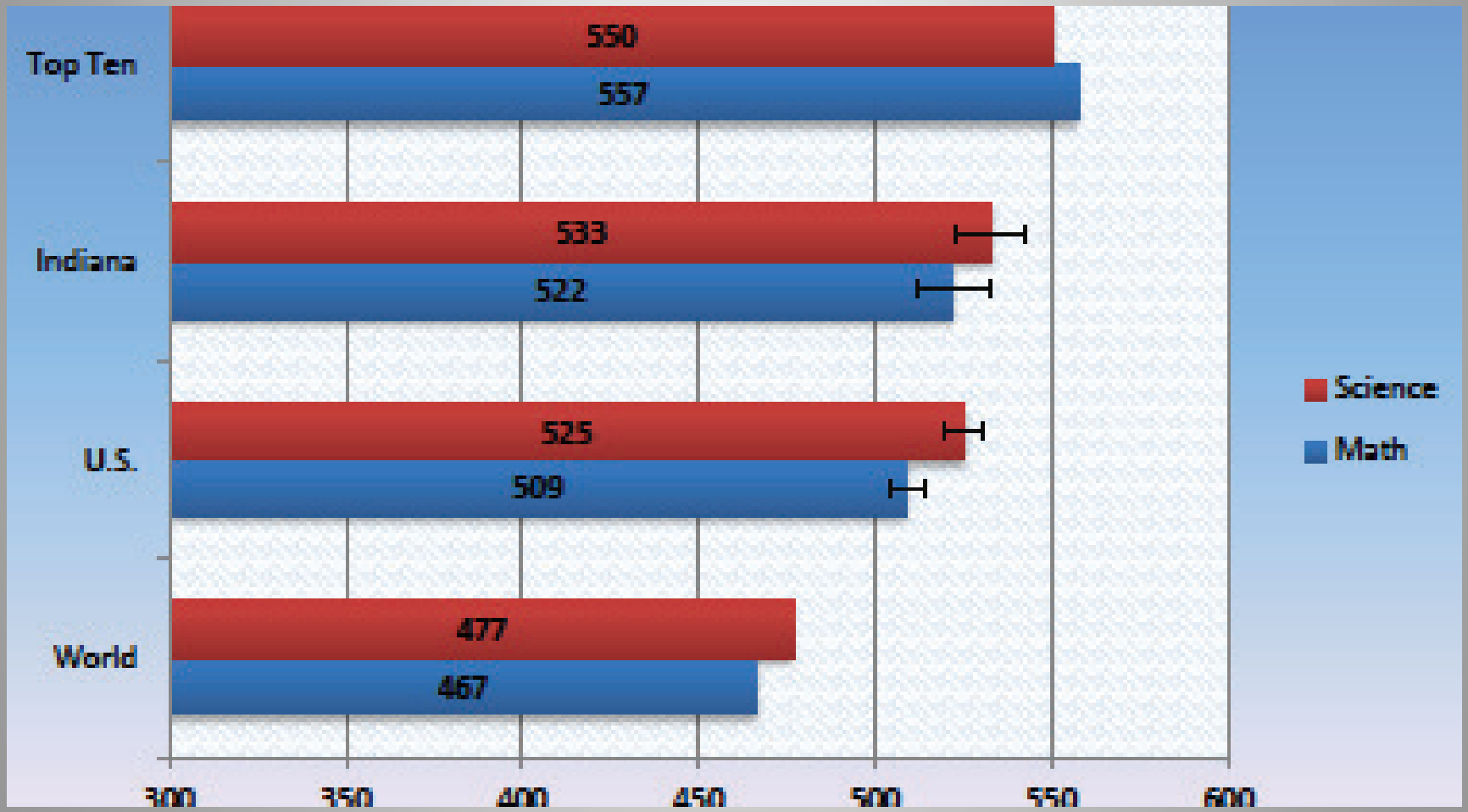
TIMSS evolved from the First and Second International Mathematics Assessments of 13-year-olds.

- How well did the U.S. relative to the 12 (mostly European) nations that participated in the First International Mathematics Study in the early 1960s?
- How well did the U.S. do relative to the 20 participants in the Second International Mathematics Study in the mid 1980s?

Indiana Participated in 2011 grade 8 TIMSS as if it was its own country.

- **How well did Indiana do relative to the U.S. and nations around the world?**

TIMSS Grade 8: 2011



TIMSS Estimation Item (Grade 8)

Which of these is the BEST estimate of $\frac{7.21 \times 3.86}{10.09}$?

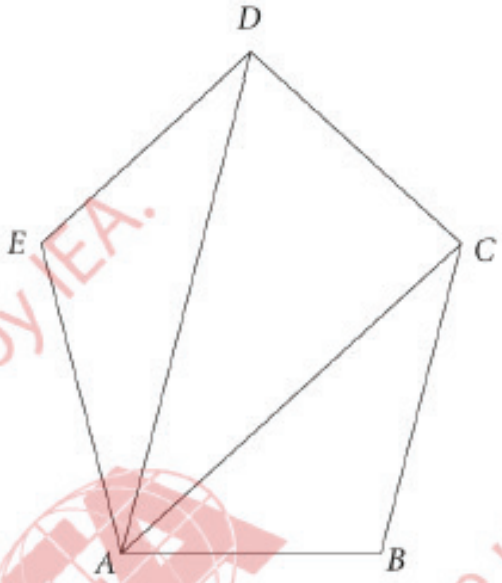
Ⓐ $\frac{7 \times 3}{10}$

Ⓑ $\frac{7 \times 4}{10}$

Ⓒ $\frac{7 \times 3}{11}$

Ⓓ $\frac{7 \times 4}{11}$

TIMSS Geometry Item (Grade 8)



What is the sum of all the interior angles of pentagon *ABCDE*?
Show your work.

Answer: _____

TIMSS Grade 4 Mathematics: 2011

- Indiana did not participate at grade 4.
- Singapore, South Korea and Japan scored higher than the U.S.
- Finland, Russia, The Netherlands, and Denmark were statistically equal to the U.S.
- The other 31 countries participating at grade 4 scored below the U.S.

TIMSS Grade 4 Science: 2011

- Indiana did not participate at grade 4.
- Singapore, Finland, Japan, and Russia and scored higher than the U.S.
- 3 countries were statistically equal to the U.S.
- All other participating countries and jurisdictions scored below the U.S.

PIRLS: 2011

- There are no state-level PIRLS data.
- Hong-Kong, Russia, Finland, and Singapore, scored higher than the U.S.
- Denmark, Croatia, Taipei, Ireland, and England, countries were statistically equal to the U.S.
- 33 countries scored below the U.S.

NAEP in the Headlines

STATEIMPACT A reporting project of npr member stations

LEARNING TEACHING PERFORMANCE POLICY FUNDING

How Indiana Students Fared On The Tests The Whole Country Cares About

NOVEMBER 7, 2013 | 10:01 AM
BY KYLE STOKES

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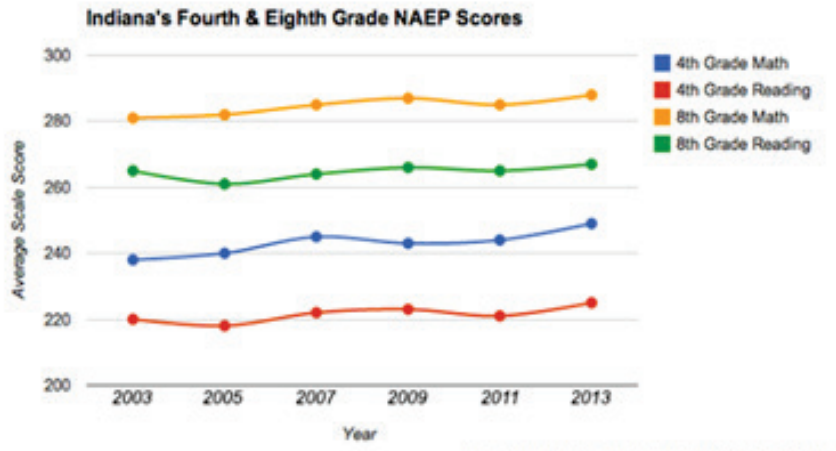

U.S. DEPARTMENT OF EDUCATION / GOOGLE DRIVE

Indiana fourth graders' and eighth graders' average scale scores on the nation's benchmark standardized test both increased. The gains in fourth grade were more substantial in Indiana than in eighth grade.

How much has Indiana's performance on the nation's benchmark standardized tests changed **since their last release in 2011**? The answer depends on how much you're willing to make of just a few points.

NAEP in the Headlines

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Both sides claim 'victory' after Indiana test scores improve, but truth is murkier

By Tom LoBianco of The Associated Press
Sunday, November 10, 2013 - 7:01 pm

INDIANAPOLIS — Of the many John F. Kennedy statements often repeated by both Democrats and Republicans, his declaration that "victory has a hundred fathers and defeat is an orphan" seemed apt for the release last week of national test scores showing solid gains by Indiana students.

Latest News

Snow brings slide-offs, cancellation *11:03 am*

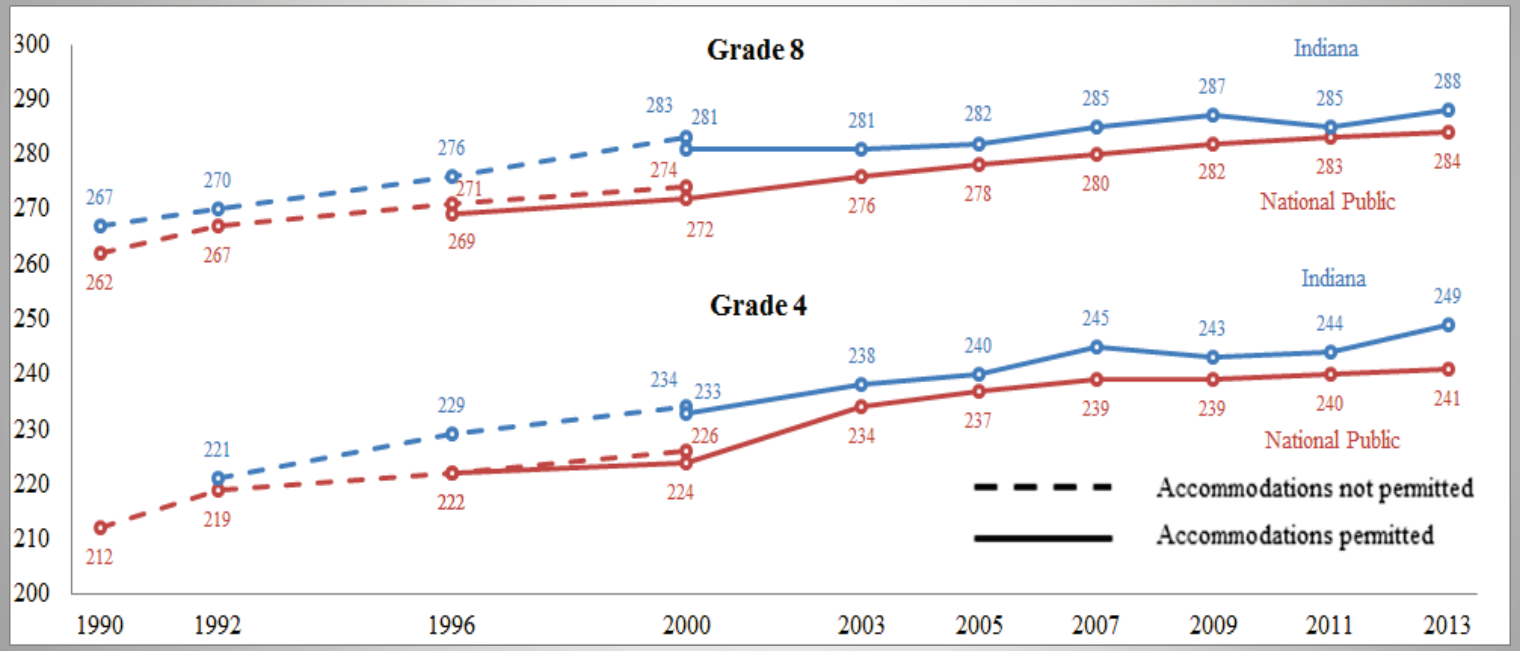
Indiana's Fischer loses brace, gains impact *3:23 am*

City Council backs study to bring passenger rail back to town *8:31 am*

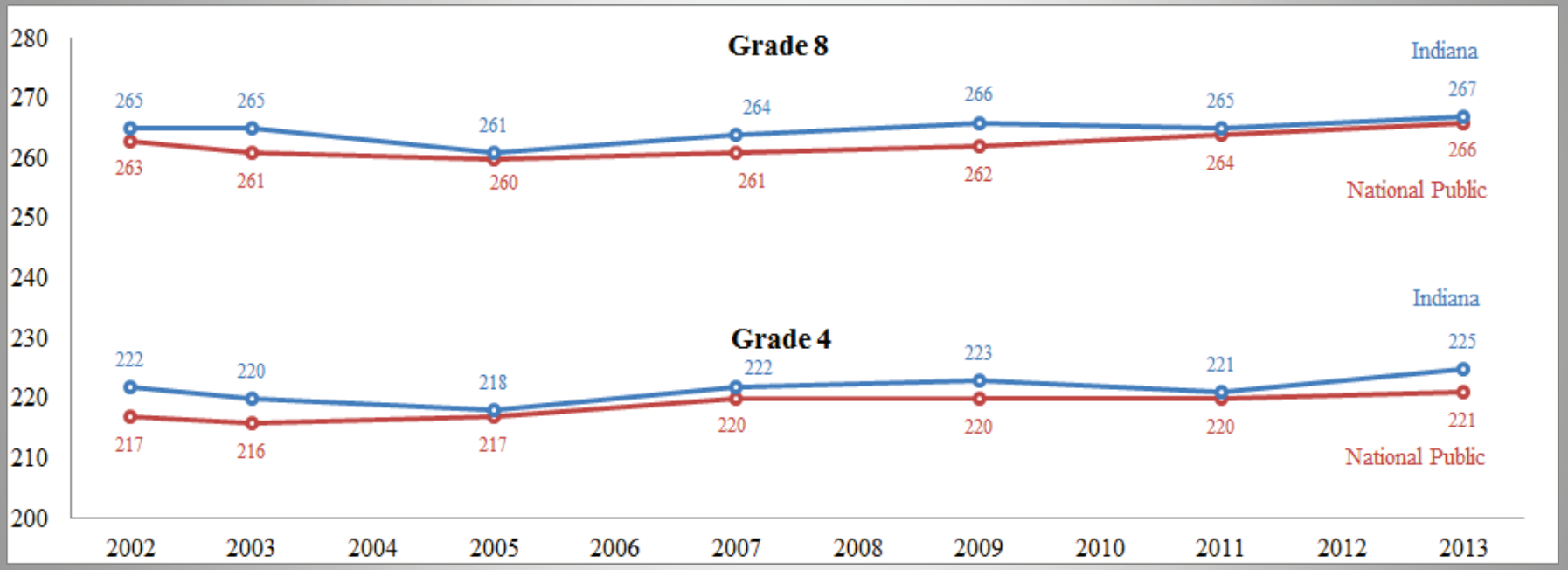
Peyton's prime extends past expectations *3:30 am*

Williams is prep volleyball Player of the Year *8:11 am*

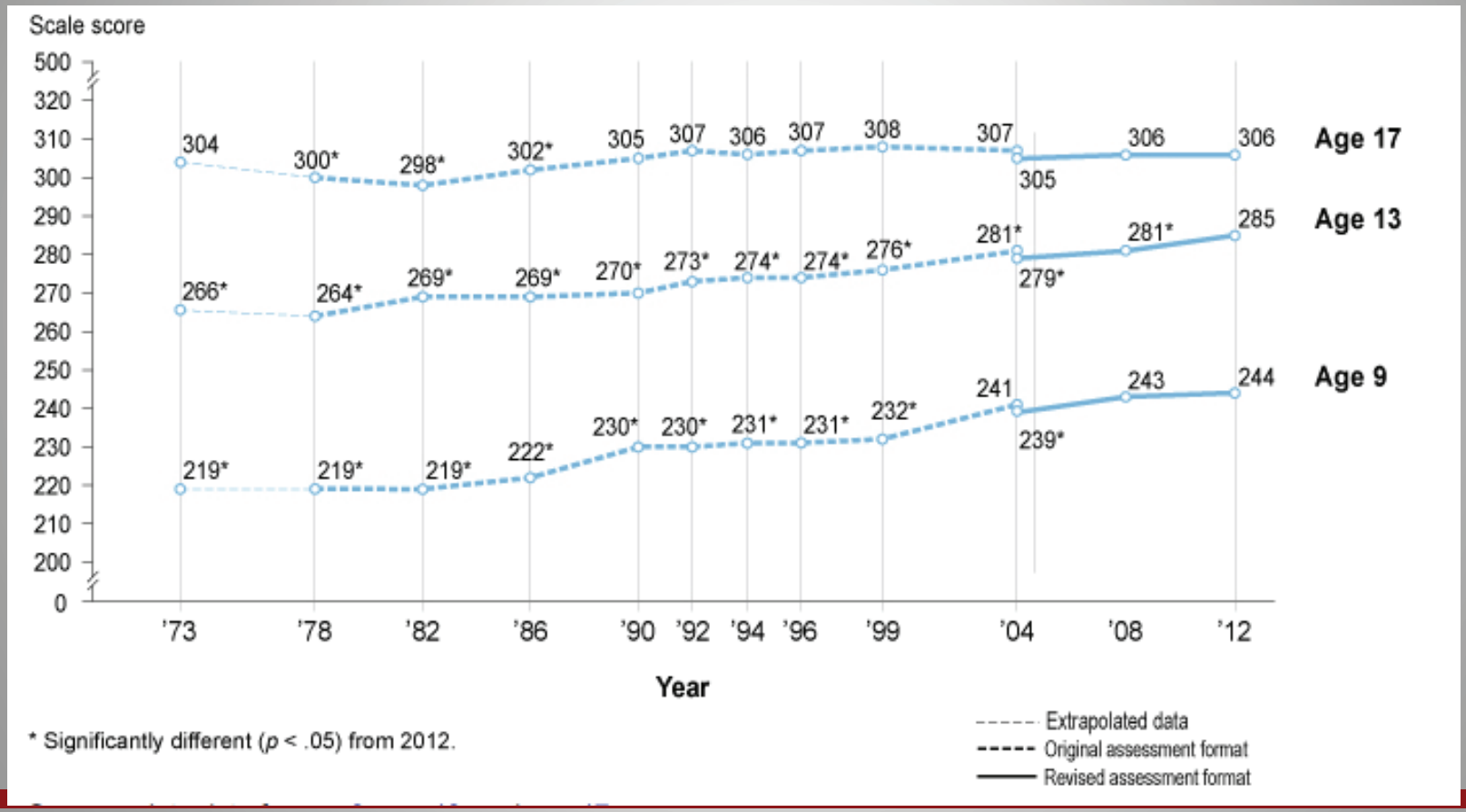
NAEP Mathematics Average Scale Scores for Indiana and the Nation, 1990 - 2013



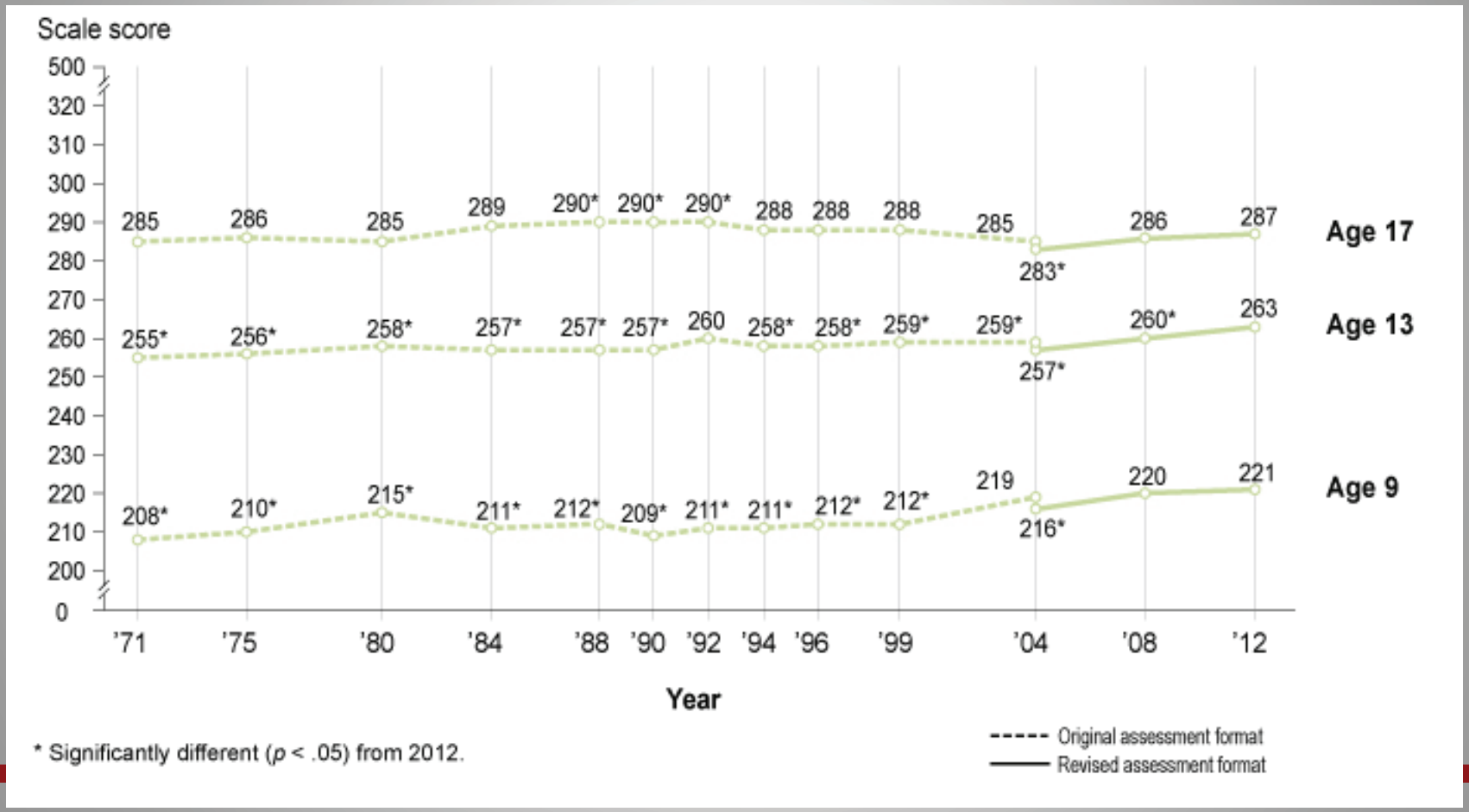
NAEP Reading Average Scale Scores for Indiana and the Nation, 2002 - 2013



NAEP (Long-Term Trend) Mathematics Performance Over Time



NAEP (Long-Term Trend) Reading Performance Over Time



NAEP

- Indiana students tend to perform above the national average and continue to show gains in scores
- Indiana scores fluctuate year to year

Grade 4:

- In math, Indiana has fluctuated between 4 and 9 points above the national average since 2000
- In reading, Indiana has fluctuated between 2 and 5 points above the national average since 2000

Grade 8:

- In math, Indiana scores have fluctuated between 2 and 9 points above the national average since 2000
- In reading, Indiana scores have fluctuated between 1 and 4 points above the national average since 2000.

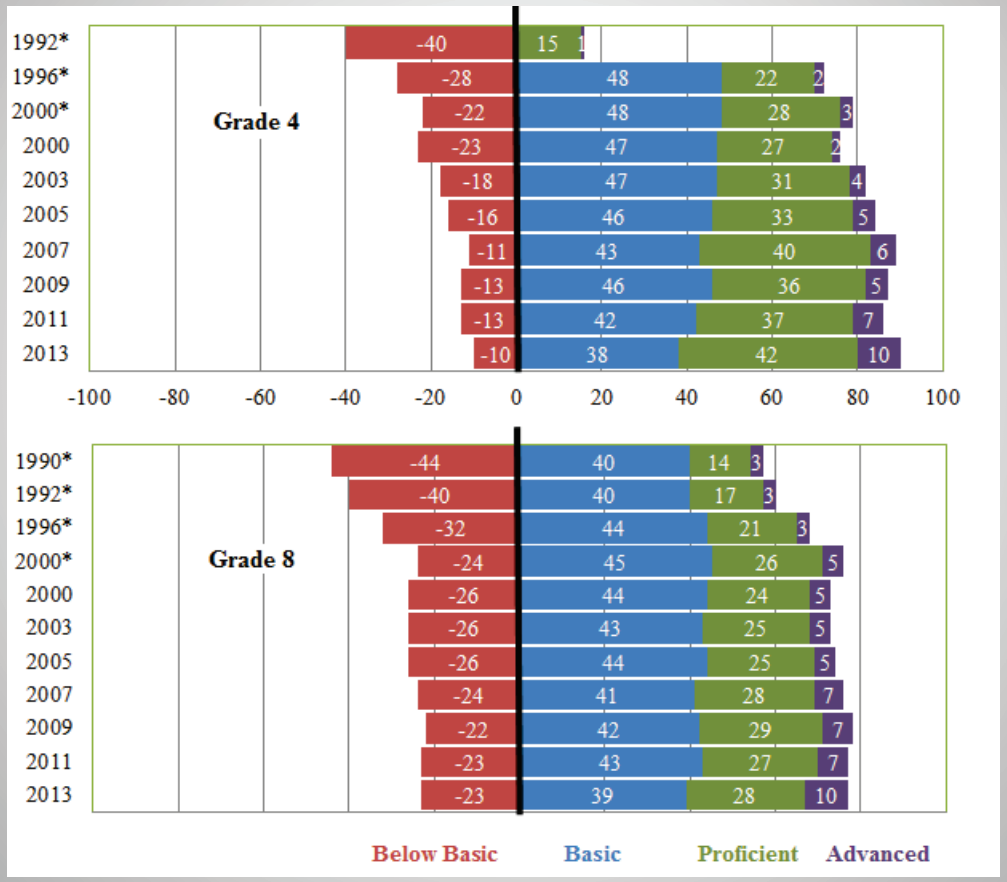
NAEP Achievement Level Descriptions

Level	Description
Basic	Partial mastery of prerequisite knowledge and skills that are fundamental for proficient work at each grade.
Proficient	Solid academic performance for each grade assessed. Students reaching this level have demonstrated competency over challenging subject matter, including subject-matter knowledge, application of such knowledge to real-world situations, and analytical skills appropriate to the subject matter.
Advanced	Superior performance.

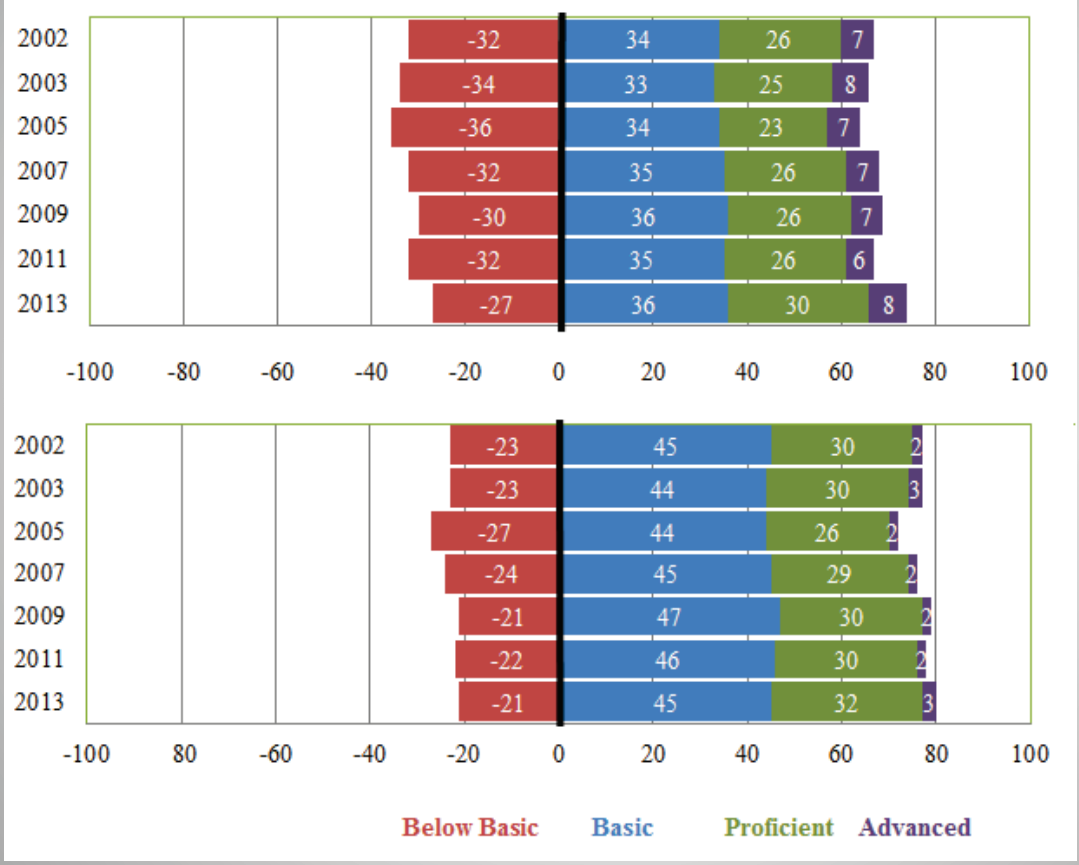
What does "Proficient" really mean?

- Chester Finn (2008) described proficient as "the 'central level,' the one that all students *ought* to attain and the proper benchmark for American education."
- Diane Ravitch (2013) described proficient as "a solid A and not less than a B+" and basic as "probably a B or C."

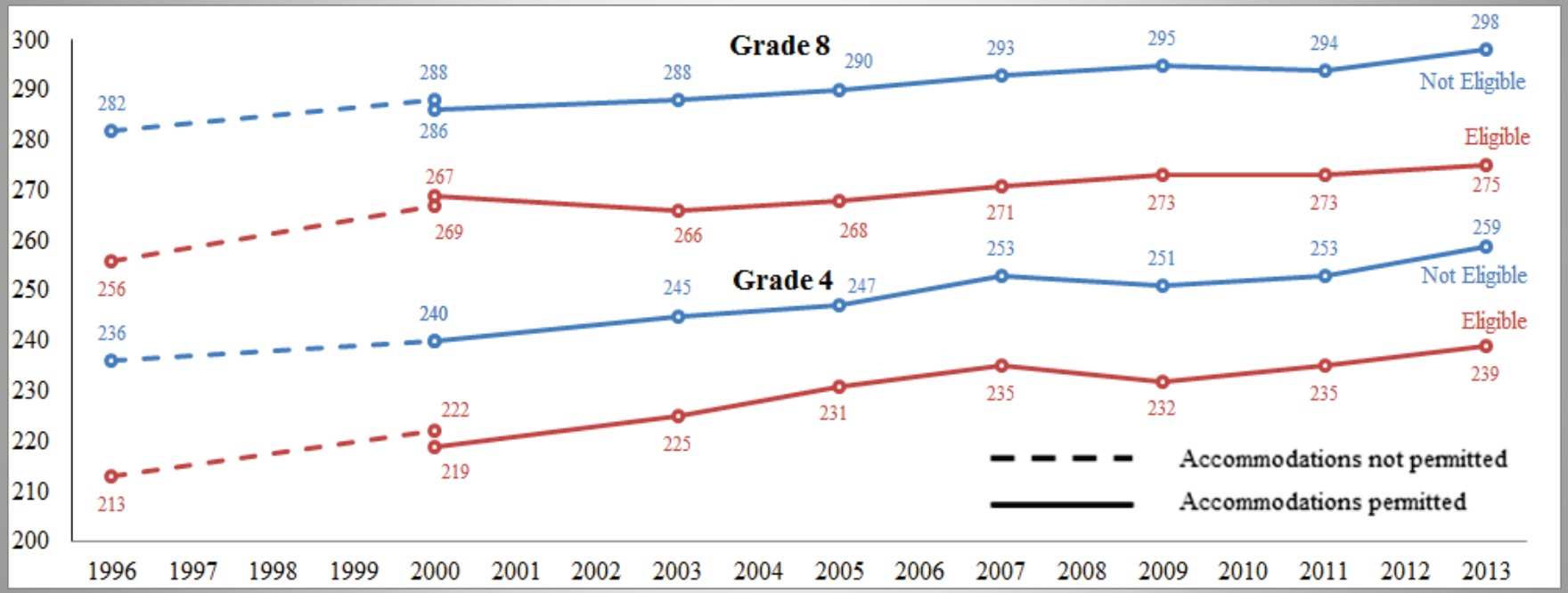
Percent of Indiana Students at Each NAEP Achievement-Level for Mathematics (2013)



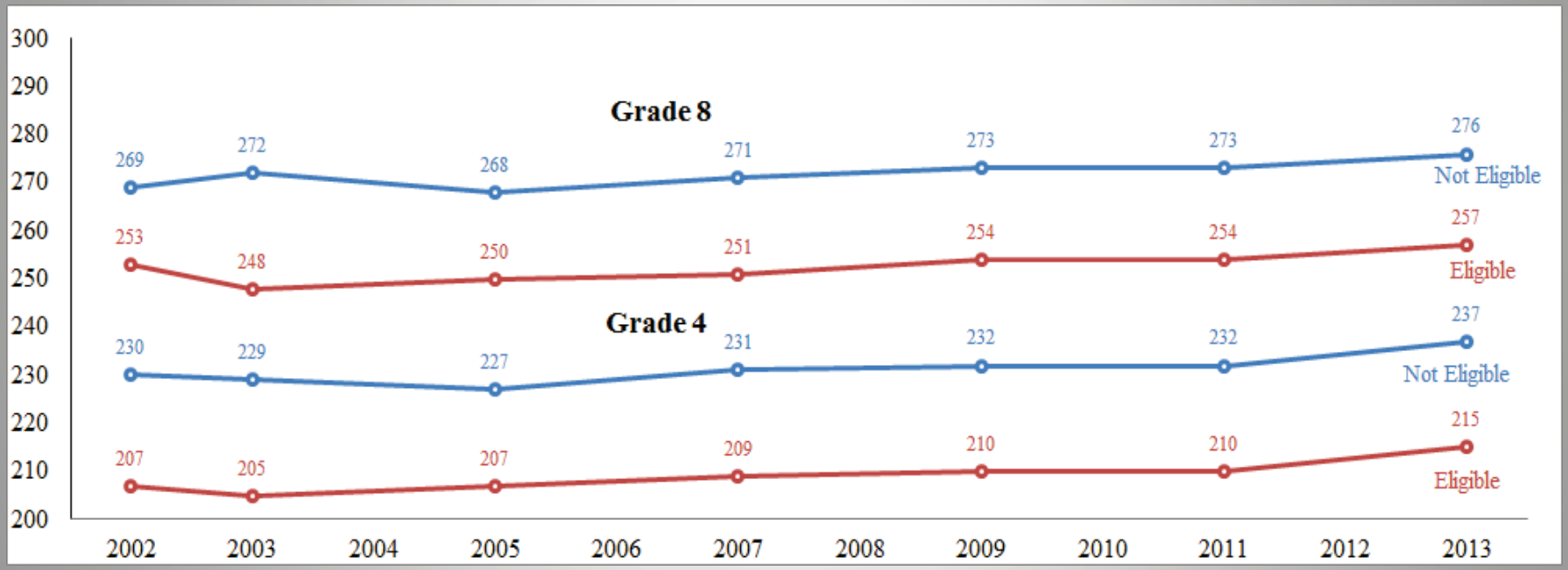
Percent of Indiana Students at Each NAEP Achievement-Level for Reading (2013)



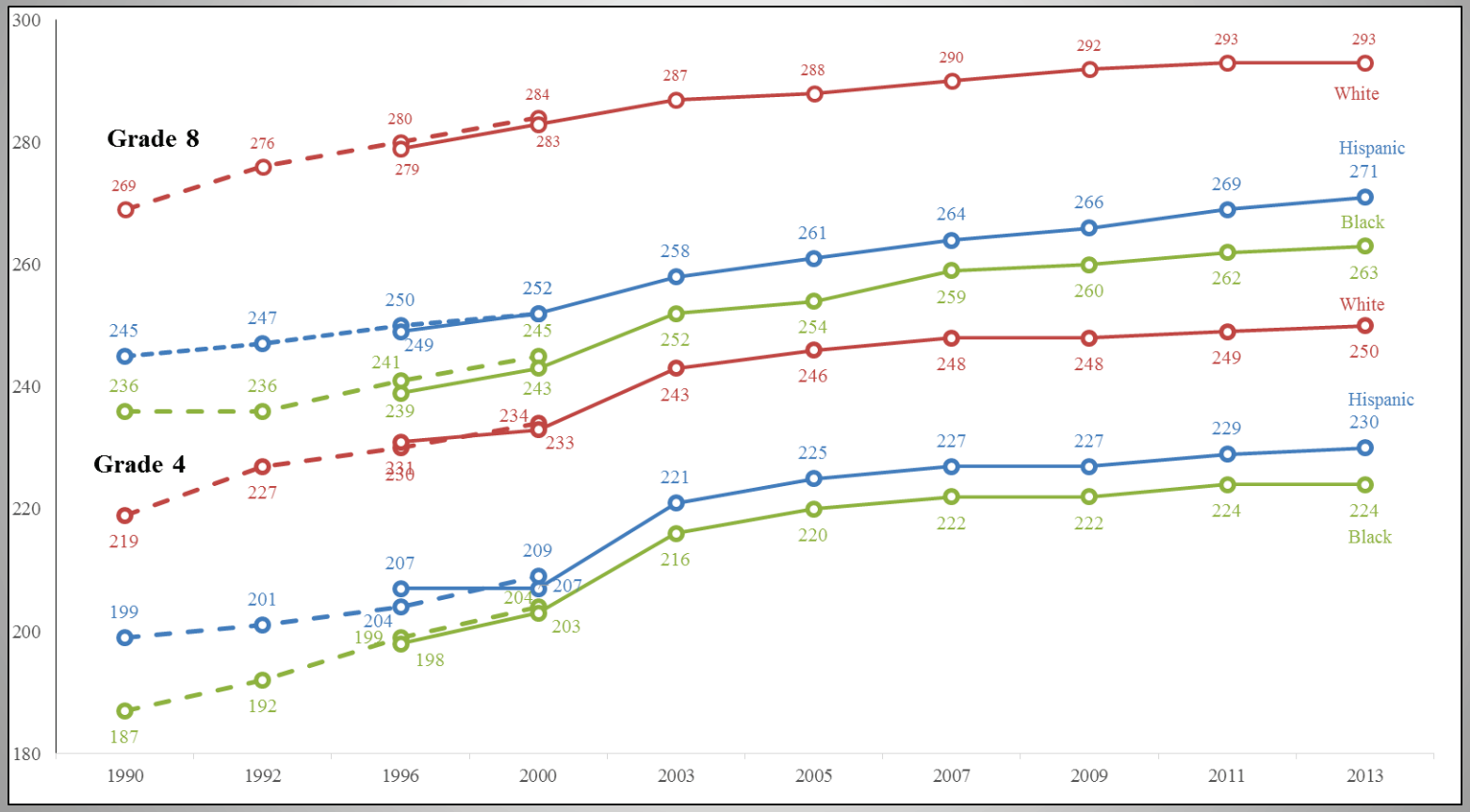
NAEP Mathematics Average Scale Scores for Indiana by Free or Reduced Lunch Eligibility, 1996-2013



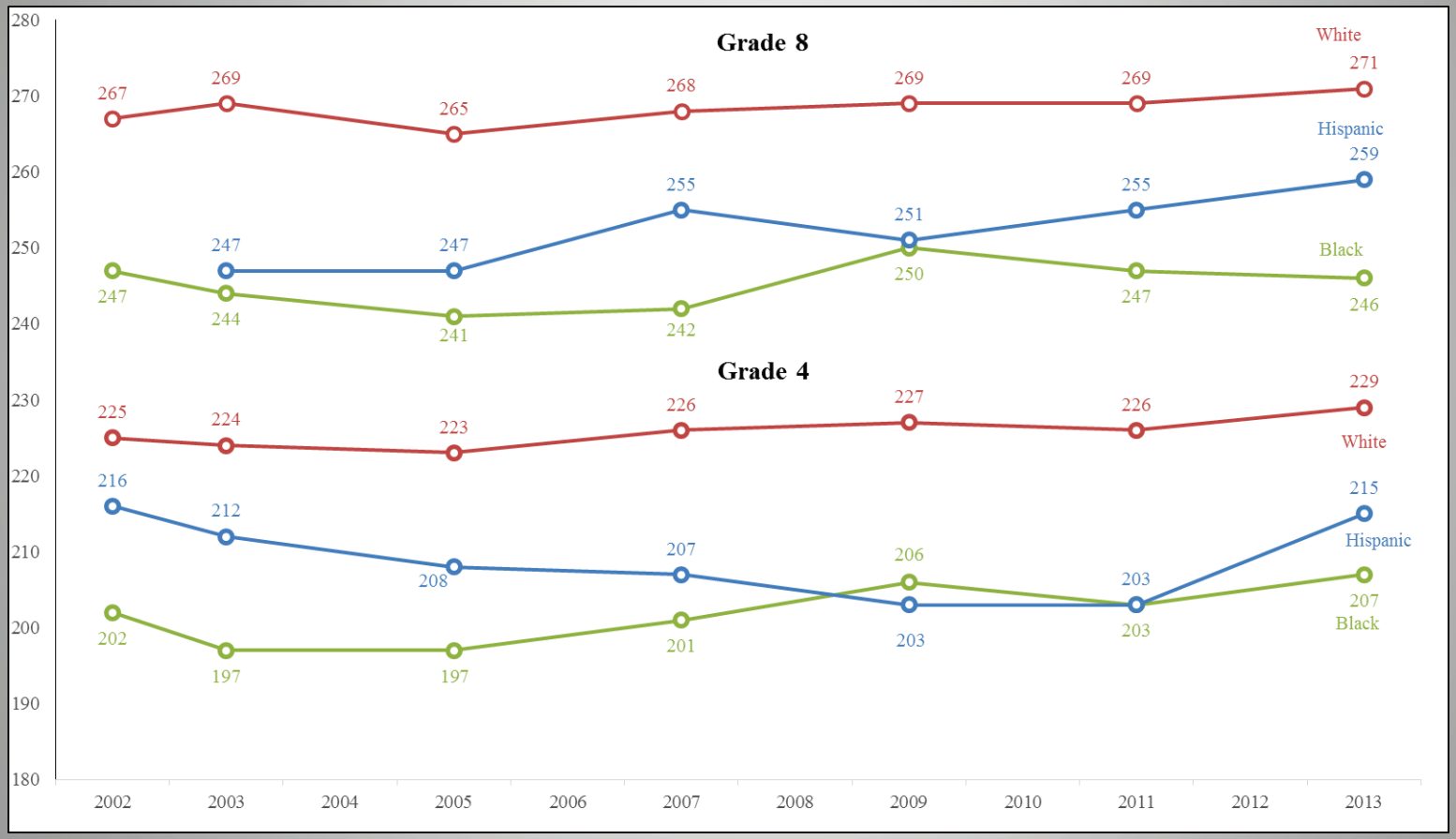
NAEP Reading Average Scale Scores for Indiana by Free or Reduced Lunch Eligibility, 2002-2013



NAEP Mathematics Average Scale Scores for Indiana by Race/Ethnicity, 1990-2013



NAEP Reading Average Scale Scores for Indiana by Race/Ethnicity, 2002-2013



NAEP

- Despite consistent gains made by Indiana students, disparities in achievement persist
- Students in Grade 4 & Grade 8 who are eligible for free and reduced lunch (FRL) tend to score approximately 20 points lower on both the NAEP math and reading assessments than those who do not qualify
- Though white, black, and Hispanic students continue to show gains in NAEP test scores, large disparities persist along racial lines in math and reading

What caused the relatively large gains by Indiana 4th graders between 2011 and 2013?

- Tony Bennett says his reforms caused the gains.
- Teresa Meredith, president of the Indiana State Teachers Association, gave credit to Indiana's state standards movement in the early 2000s.
- Data indicate that the gains were likely a combination of statistical variance due to small sample sizes and the IREAD-based retention of low performing students in 3rd grade.

Key Findings

- Poverty and SES play a significant role in student performance, impact school performance
- On the PISA assessment, U.S. students performing slightly lower in math than other OECD countries, on par in reading and science with OECD countries
- Indiana students continue to perform above the national average on NAEP; however disparities in performance persist
- Students' ISTEP pass rates continue to increase

Web Resources

- PISA: nces.ed.gov/Surveys/PISA
- NAEP: nationsreportcard.gov
- TIMSS & PIRLS: timss.bc.edu
- IU Research on NAEP:

  ceep.indiana.edu/ImplicationsFromNAEP
- ISTEP:

  www.doe.in.gov/assessment/istep-results

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